What is claimed is:

1. An analyte detection device comprising:

a body;

a porous membrane coupled to the body;

a top member positioned at a spaced distance above the porous membrane such that a first cavity is formed between the top member and the porous membrane, wherein the top member covers at least a portion of the porous membrane, and wherein the top member is substantially transparent to light; and

a bottom member positioned below the porous membrane, wherein the bottom member is configured to receive fluid flowing through the porous membrane during use.

2. The device of claim 1, wherein the porous membrane comprises pores having a diameter between about 0.2 microns to about 12 microns.

3. The device of claim 1, wherein the top member is substantially transparent to visible light.

4. The device of claim 1, wherein the bottom member is substantially transparent to visible light.

5. The device of claim 1, wherein the top member is substantially transparent to visible light, and wherein the bottom member is substantially transparent to visible light.

6. The device of claim 1, wherein the top member is substantially transparent to ultraviolet light.

7. The device of claim 1, wherein the bottom member is substantially transparent to ultraviolet light.

8. The device of claim 1, wherein the top member is substantially transparent to ultraviolet light, and wherein the bottom member is substantially transparent to ultraviolet light.

9. The device of claim 1, wherein the bottom member comprises an indentation configured to receive the membrane.

10. The device of claim 1, wherein the bottom member comprises a first indentation configured to receive the filter and a second indentation which is configured to receive fluid passing through the membrane during use.

11. The device of claim 1, further comprising a membrane support coupled to the membrane, wherein the membrane support is composed of a porous material.

12. The device of claim 11, wherein the membrane support comprises pores that allow fluid to flow through the membrane support at a speed that is equal to or greater than the speed that fluid passes through membrane.

13. The device of claim 11, wherein the membrane support provides sufficient support of the membrane during use to inhibit sagging of the membrane.

14. The device of claim 11, wherein the membrane support is configured to maintain the membrane in a substantially planar orientation during use.

15. The device of claim 1, further comprising a gasket positioned between the membrane and the top member.

16. The device of claim 1, wherein the top member comprises a fluid inlet configured to allow fluid to be introduced to the membrane through the top member.

17. The device of claim 1, wherein the bottom member comprises a fluid outlet configured to allow fluid to pass from the membrane out of the analyte detection device.

18. The device of claim 1, wherein the top member comprises a fluid inlet configured to allow fluid to be introduced to the membrane through the top member, and wherein the top member comprises a wash fluid outlet configured to allow fluid to pas from the membrane out of the analyte detection device during a washing operation.

19. The device of claim 1, further comprising a body and a cap, wherein the top member, the membrane and the bottom member are disposed within the body, and wherein the cap secures the top member, the membrane and the bottom member within the body.

20. The device of claim 1, wherein top member is composed of an acrylate polymer.

21. The device of claim 1, wherein the top member and the bottom member are composed of an acrylate polymer.

22. An analyte detection system comprising:

an analyte detection device, the analyte detection device comprising:
a body;
a porous membrane coupled to the body;
a top member positioned at a spaced distance above the porous membrane such that a first cavity is formed between the top member and the porous membrane, wherein the top member covers at least a portion of the porous membrane, and wherein the top member is substantially transparent to light; and

a bottom member positioned below the porous membrane, wherein the bottom member is configured to receive fluid flowing through the porous membrane during use

a detector optically coupled to the porous membrane, wherein the detector is configured to view at least a portion of the membrane through the window;

a fluid delivery system coupled to the analyte detection device, wherein the fluid delivery system is configured to deliver fluid samples to the analyte detection device.

23. The system of claim 22, wherein the detector comprises a CCD camera.

24. The system of claim 22, wherein the fluid delivery system comprise one or more pumps.

25. The system of claim 22, wherein the fluid delivery system comprises a plurality of pumps, each of the pumps coupled to a different fluid storage container.

26. The system of claim 22, wherein the fluid delivery system comprises one or pumps and one or more filters, wherein the filters are configured to filter fluids before the fluids are delivered to the analyte detection device.

27. The system of claim 22, wherein the analyte detection device comprises a fluid inlet, and wherein the fluid delivery system comprises a plurality of pumps each of the pumps coupled to a different fluid storage container and a manifold, wherein the manifold is configured to redirect fluid from received from at least a portion of the pumps to the fluid inlet.

28. The system of claim 22, wherein the detector comprises a microscope.

29. The system of claim 22, further comprising a programmable controller coupled to the fluid delivery system.

30. The system of claim 29, wherein the programmable controller is further coupled to the detector.

31. A method of sensing an analyte in a fluid comprising:

passing the fluid across a porous membrane configured to capture the analyte on the porous membrane;

detecting an image of matter captured on the porous membrane; and

determining if the analyte is present on the porous membrane.

32. The method of claim 31, further comprising passing the analyte to a sensor array if the image meets the user-defined criteria.

33. The method of claim 32, wherein the sensor array comprises a porous particle.

34. The method of claim 31, wherein determining if the analyte is present comprises comparing the shape of the matter to user-defined criteria.

35. The method of claim 31, determining if the analyte is present comprises comparing the size of the matter to user-defined criteria.

36. The method of claim 31, determining if the analyte is present comprises comparing the aggregate area of the matter to user-defined criteria.

37. The method of claim 31, determining if the analyte is present comprises comparing the color of the matter to user-defined criteria.

38. The method of claim 31, determining if the analyte is present comprises comparing the fluorescence of the matter to user-defined criteria.

39. The method of claim 31, determining if the analyte is present comprises comparing the fluorescent intensity of the matter to user-defined criteria.

40. The method of claim 31, further comprising applying a stain to the matter captured on the membrane.

41. The method of claim 31, further comprising collecting a sample of an analyte in a fluid using an air collection device.

42. The method of claim 31, further comprising passing a background fluid through the filter and detecting an image captured on the porous membrane prior to passing the fluid containing the analyte across the porous membrane.

43. The method of claim 31, further comprising performing a lateral flush to clean the surface of the membrane prior to passing the fluid containing the analyte across the membrane.

44. The method of claim 31, further comprising performing a back flush to clean the surface of the membrane prior to passing the fluid containing the analyte across the membrane.

45. The method of claim 31, wherein detecting an image is performed using a CCD detector.

46. The method of claim 31, wherein detecting an image is performed using a microscope.

47. The method of claim 31, further comprising further comprising passing a visualization agent across the membrane after the fluid is passed over the membrane.

48. The method of claim 31, further comprising performing a lateral wash of the membrane after detecting an image.

49. The method of claim 31, further comprising performing a back wash of the membrane after detecting an image.

50. A method of analyzing an analyte collected on a membrane comprising:

passing a fluid sample across a membrane, wherein the fluid sample comprises an analyte that is at least partially retained by the membrane;

adding a visualization agent to material collected on the membrane when the fluid sample is passed across the membrane;

collecting an image of the collected material using white light, at a first wavelength of light, a second wavelength of light, and a third wavelength of light, wherein the analyte comprises a color corresponding to the first wavelength of light;

forming a first mask corresponding to an image of the collected material at the second wavelength of light;

forming a second mask corresponding to an image of the collected material at the third wavelength of light;

subtracting the first mask and the second mask from the image of the collected material in white light.

51. The method of claim 50, wherein the wavelengths of light are selected from the group consisting of red, blue and green.

52. The method of claim 50, wherein the collecting the image data and forming the masks is performed by a computer.

53. The method of claim 50, further comprising determining the amount of analyte present on the membrane by analysis of the image resulting from subtracting the first mask and the second mask from the image of the collected material in white light.

54. The method of claim 50, wherein the images are collected using a CCD detector.

55. The method of claim 50, wherein the images are collected using a CCD detector coupled to a microscope.

56. A particle for detecting an analyte in a fluid comprising a receptor coupled to a polymeric resin, wherein the polymeric resin comprises a plurality of pores having a diameter of less than about 1 μm.

57. The particle of claim 56, further comprising a receptor coupled to the surface of one of the pores.

58. The particle of claim 56, wherein the particle comprises agarose.

59. The particle of claim 56, wherein the particle is substantially spherical.

60. The particle of claim 56, wherein the particle has a a diameter of between about 100 to 500 microns.

61. The particle of claim 56, wherein the particle is configured to entrap microbes.

62. A method for forming a porous particle, comprising:

forming an emulsion of a polymeric resin in an aqueous solution;

reducing the temperature of the emulsion to produce the porous particle, wherein the porous particle comprises a plurality of pores having a diameter of less than about 1 μm.

63. The method of claim 62, wherein forming an emulsion comprises adding an emulsifier to a mixture of the polymeric resin in water.

64. A porous particle, formed by the method of claim 62.

65. A method for detecting a microbe, comprising:

passing the fluid over a porous particle configured to capture the microbe; and detecting the microbe with a detector.

66. The method of claim 65, wherein a receptor configured to receive the microbe is coupled to the porous particle.

67. A system for detecting an analyte in a fluid comprising:

a light source;

a sensor array, the sensor array comprising a supporting member comprising at least one cavity formed within the supporting member;

a particle, the particle positioned within the cavity, wherein the particle is configured to produce a signal when the particle interacts with the analyte during use, and wherein the particle comprises a receptor coupled to a polymeric resin, wherein the polymeric resin comprises a plurality of pores having a diameter of less than about 1 μm; and

a detector, the detector being configured to detect the signal produced by the interaction of the analyte with the particle during use;

wherein the light source and detector are positioned such that light passes from the light source, to the particle, and onto the detector during use.

68. A method of sensing an analyte in a fluid comprising:

passing a fluid over a sensor array, the sensor array comprising at least one particle positioned within a cavity of a supporting member, wherein the particle comprises a receptor coupled to a polymeric resin, wherein the polymeric resin comprises a plurality of pores having a diameter of less than about 1 μm;

monitoring a spectroscopic change of the particle as the fluid is passed over the sensor array, wherein the spectroscopic change is caused by the interaction of the analyte with the particle.

69. A method of sensing an analyte in a fluid comprising:

passing the fluid across a porous membrane configured to capture the analyte on the porous membrane;

applying a visualization agent to the particles on the porous membrane;

detecting an image of matter captured on the porous membrane with a detector at a plurality of wavelengths of light;

detecting an image of matter captured on the porous membrane at a specific wavelength pf light, wherein the specific wavelength of light represents light that is not indicative of the presence of the analyte.

70. A method of forming a sensor array comprising:

forming a plurality of cavities in a supporting member;

forming a plurality of particles, wherein each particle comprises a receptor coupled to a polymeric resin, wherein a plurality of different receptors are coupled to the particles;

interacting the plurality of particles with an analyte;

determining which particles interact with the analyte and the extent to which the interact with the analyte;

separating particles that interact with the analyte and meet a predetermined criteria from particles that do not substantially interact with the analyte or do not meet a predetermined criteria;

adding the separated particles that interact with the analyte and meet the predetermined criteria to a sensor array.

71. The method of claim 70, wherein separating the particles comprises separating the particles using a flow cytometer.

72. A method of sensing an HIV virus in blood comprising:

passing blood across a porous membrane, wherein the porous membrane is configured to retain white blood cells while allowing other materials in the blood sample to pass through; and

determining the amount of white blood cells and the type of white blood cells captured by the membrane.

73. An analyte detection device comprising:

a body;

a porous membrane coupled to the body.